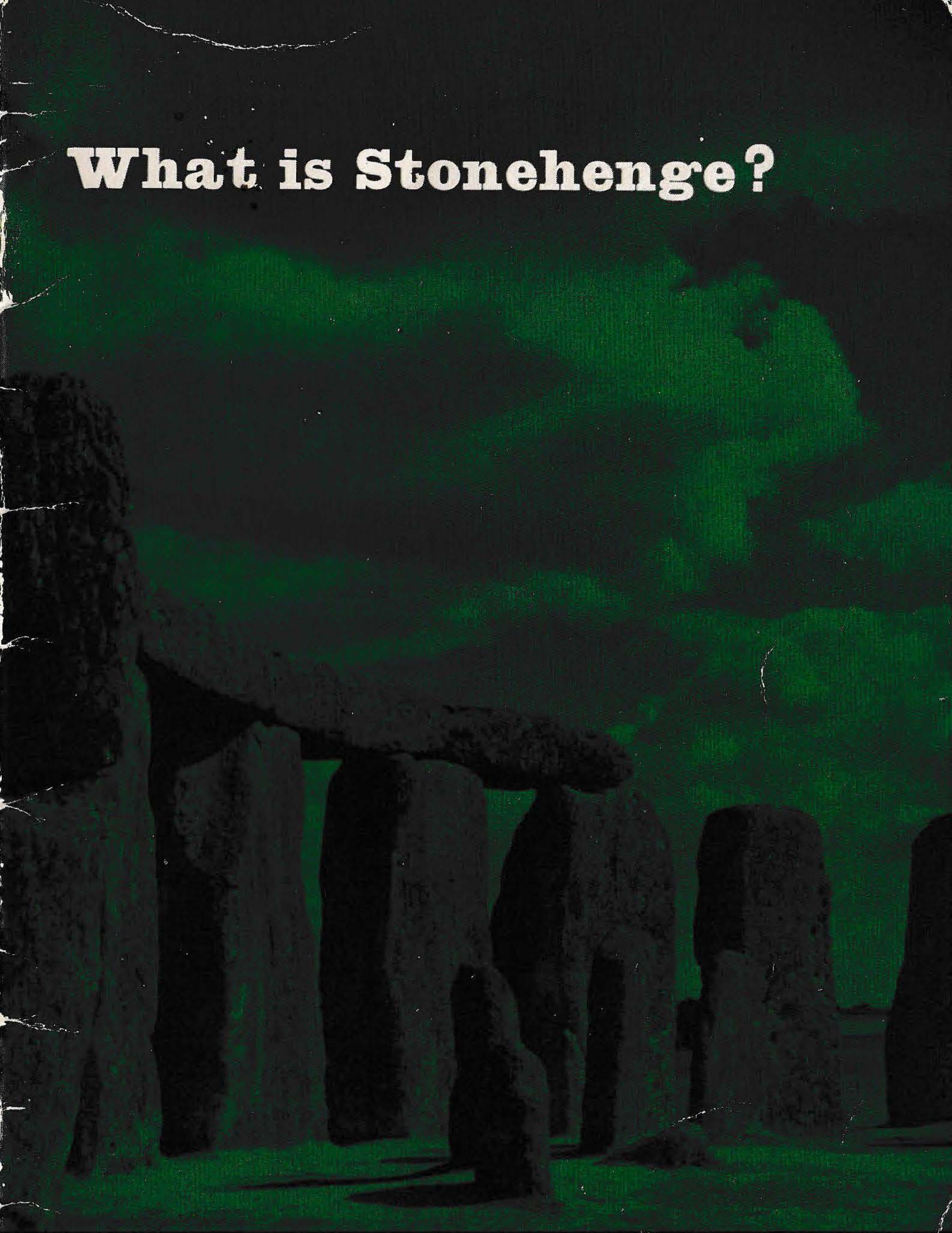
What is Stonehenge?



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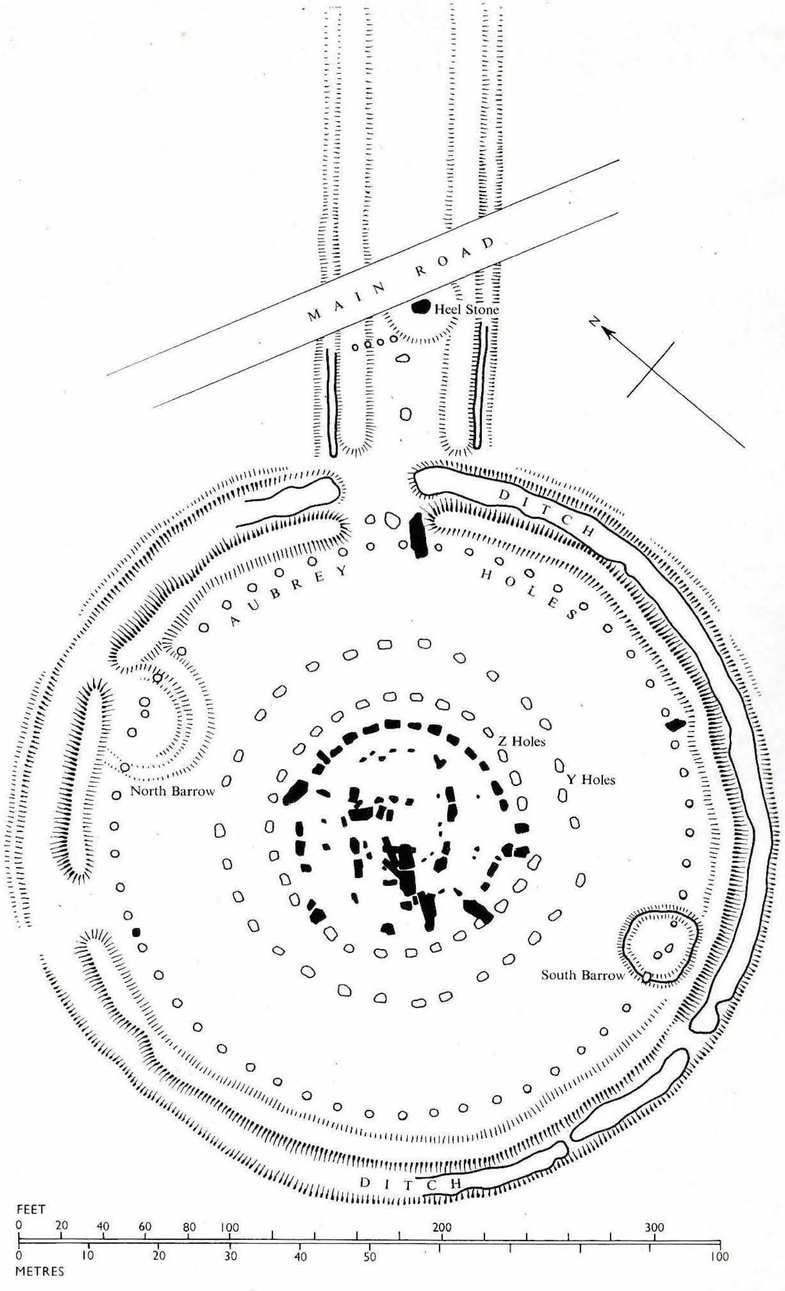
MAIN ROAD
Heel Stone
N
DITCH
AUBREY HOLES
Z Holes
Y Holes
North Barrow
South Barrow
DITCH
FEET
0 20 40 60 80 100 200 300
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METRES

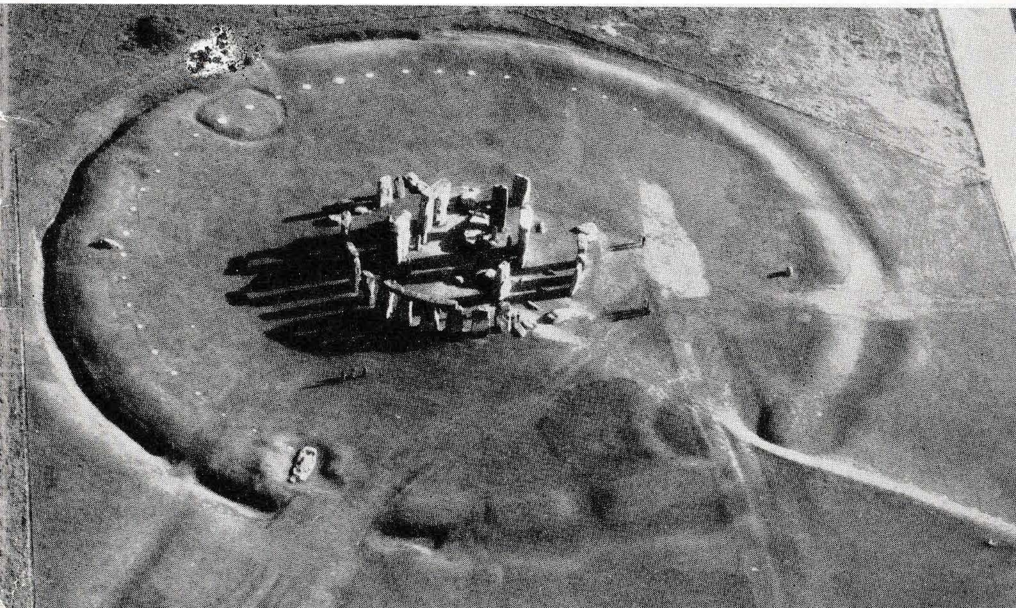
What is Stonehenge ?

Stonehenge is the most famous prehistoric temple in Europe, and is visited every year by more than a quarter of a million people. Recently archaeologists have been carrying out excavations on the site, and this Guide tells you some of the things they have discovered. The plan opposite will help you to find your way about.

When you get inside the gate, walk first along the fence by the main road to the Heel Stone. Stand with your back to it, facing away from the road. On your right and left are low banks and ditches, the sides of the Stonehenge Avenue, which starts here and runs away across the fields behind you to the River Avon. Its course is shown on the map on the back cover.

In front of you is the entrance gap in the great circular ditch and bank which surrounds Stonehenge. You can see it better in the photograph below, taken from an aeroplane. In this gap there lies a large fallen stone, one of two which originally stood upright here to make a narrow gateway.

If you walk clockwise round the bank, you will come first to one of the Station Stones, leaning outwards, and then to the South Barrow, a circular space marked out by a small ditch, in which there was once a similar stone. The corresponding Station Stone and the North Barrow are on the opposite side of the circle. Just inside the bank the Aubrey Holes, discovered by the antiquary John Aubrey 300 years ago, form a complete circle of 56 pits; but only the excavated ones are marked by



white spots in the grass. The eastern half of the ditch is deeper than the rest, because it was excavated forty years ago.

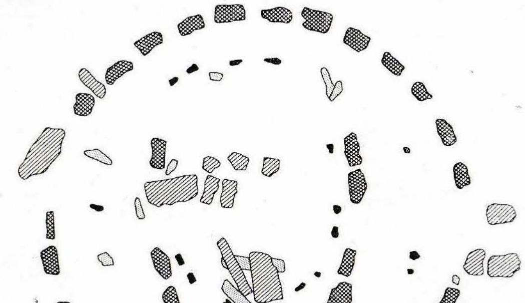
Closer to the stones in the centre there are two other rings of filled-up pits, called the Y and Z Holes. They are not marked on the ground like the Aubrey Holes, but some of them can be seen as slight hollows.

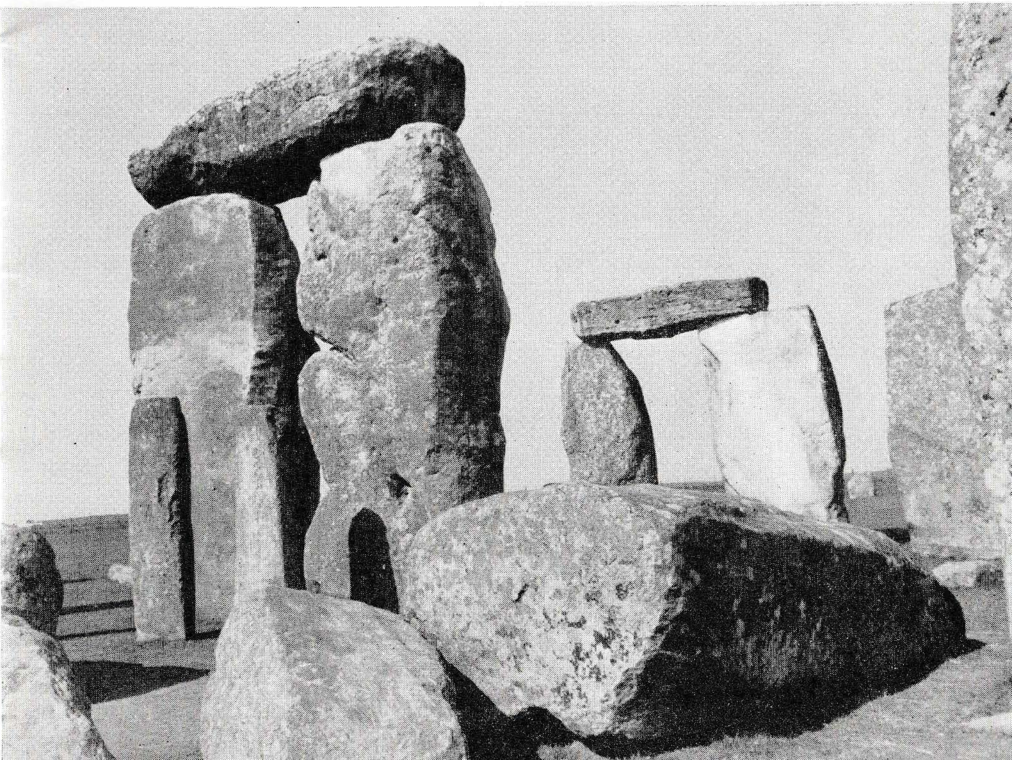
The stones in the centre, whose plan is shown in more detail below, are of two kinds. The large ones are of sarsen stone, a kind of natural sandstone which can still be found as large boulders on the surface of the Marlborough Downs, about 20 miles north of Stonehenge. The smaller stones are known, because of their colour, as the bluestones. They were brought to Stonehenge from Pembrokeshire in south-west Wales, more than a hundred miles away.

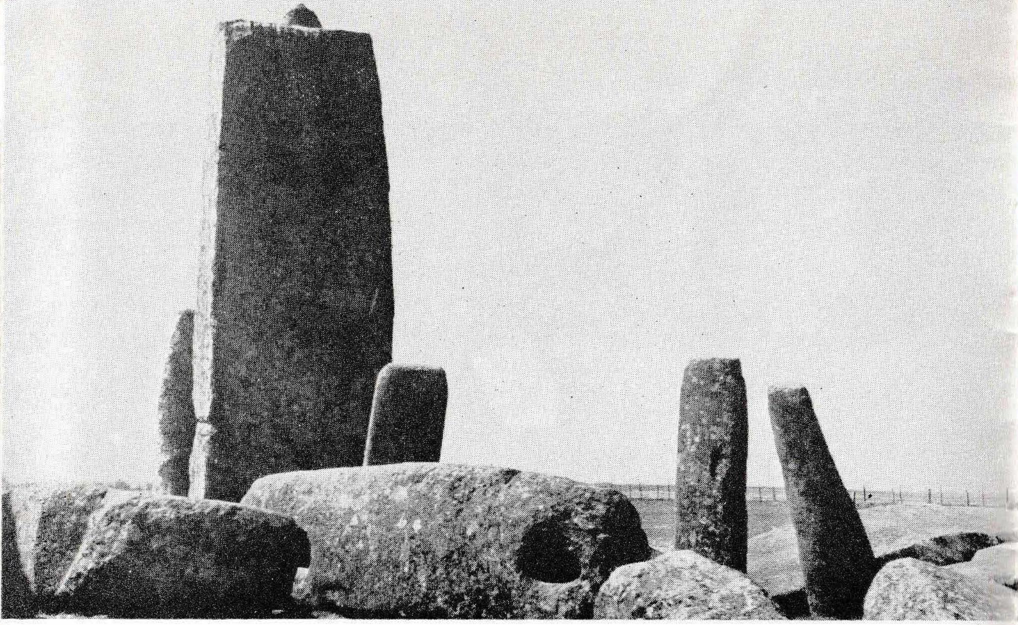
The sarsens were arranged in a circle about 100 feet across, consisting of 30 uprights weighing around 25 tons each and standing 14 feet high. On their tops was a ring of 30 lintels, most of which are now missing. Part of this outer circle is shown on the opposite page (upper photograph).

The largest sarsen stones were arranged inside the circle in the form of a horseshoe, the open end of which faces the Avenue. There were originally five groups of two uprights with a lintel on top, like the one shown opposite (lower photograph), but only three are still complete. They are known as trilithons, from the Greek words for 'three stones'.

All the sarsen stones in the central part of Stonehenge have been carefully shaped, as one can see by comparing them with the Heel







Stone, which is simply a large boulder in its natural state. The shaping was done by pounding the rock with heavy stone hammers, and so gradually smoothing the rough natural surface. The stone is so hard that it can be cut only with great difficulty, even with modern steel tools. This work must have been done when the stones were still lying flat on the ground. When they were put up, many of the stone hammers, some as big as a football, were wedged into the holes in which they stand to hold them in place.

Stonehenge is different from all other prehistoric stone circles in several ways. One of them is the shaping of the stones; another is the manner in which they are joined together. As can be seen in the photograph above, there are projecting knobs or tenons on top of the uprights, which fit into corresponding holes or mortises in the under sides of the lintels. The uprights of the outer circle have two tenons, as each one supported the ends of two lintels; and these lintels are also fitted to each other by tongue-and-groove joints.

The bluestones were also arranged in a circle and a horseshoe, though many of them are now missing. In the circle the stones are mostly natural boulders, not artificially smoothed. But in the horseshoe all the bluestone pillars have been carefully shaped with stone hammers, like the sarsens.

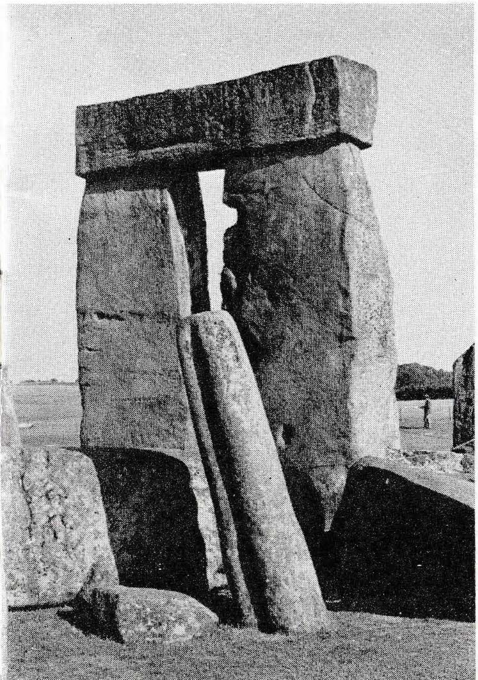
Some of these pillars, like the two on the next page, have been jointed to other stones. One, below left, has a groove carefully worked all down the nearer side; and another stone in the horseshoe, now only a buried stump, has a corresponding tongue which must have fitted into this groove.

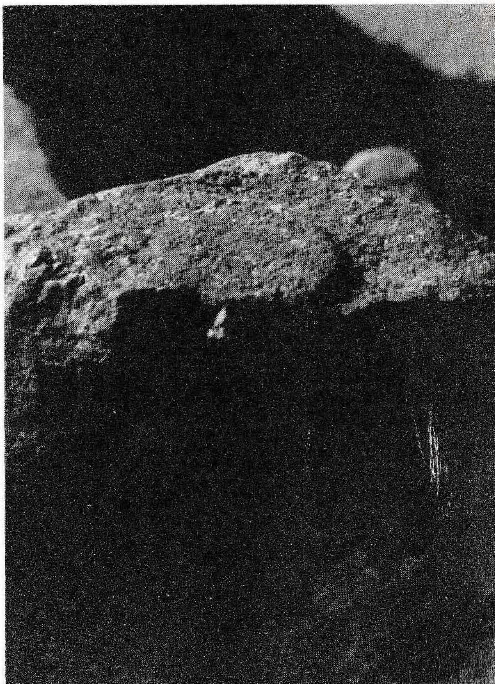
The stone whose top is shown below right (it is too high up to be seen from the ground) still has on it the remains of a tenon, which has been deliberately battered away. There are two other stones in the horseshoe from which the tenons have been removed even more completely, leaving only a slight swelling which can just be felt with the hand.

Obviously at one time these pillars must have been used as the uprights of bluestone trilithons, copied on a smaller scale from the much larger trilithons of sarsen stone. Indeed, the lintels for two of these trilithons still remain, though re-used as pillars in the bluestone circle. One of them is shown on page 9.

So we can see that the bluestones have been arranged more than once, in different positions; and there is other evidence that Stonehenge was not all built at the same time. The Y and Z Holes, for instance, must have been dug *after* the sarsen stones were put up; and it is clear that there were already bluestones at Stonehenge *before* the sarsens arrived.

What we see today at Stonehenge, therefore, is only the last of several stages of building, which followed one another over a long period of time.





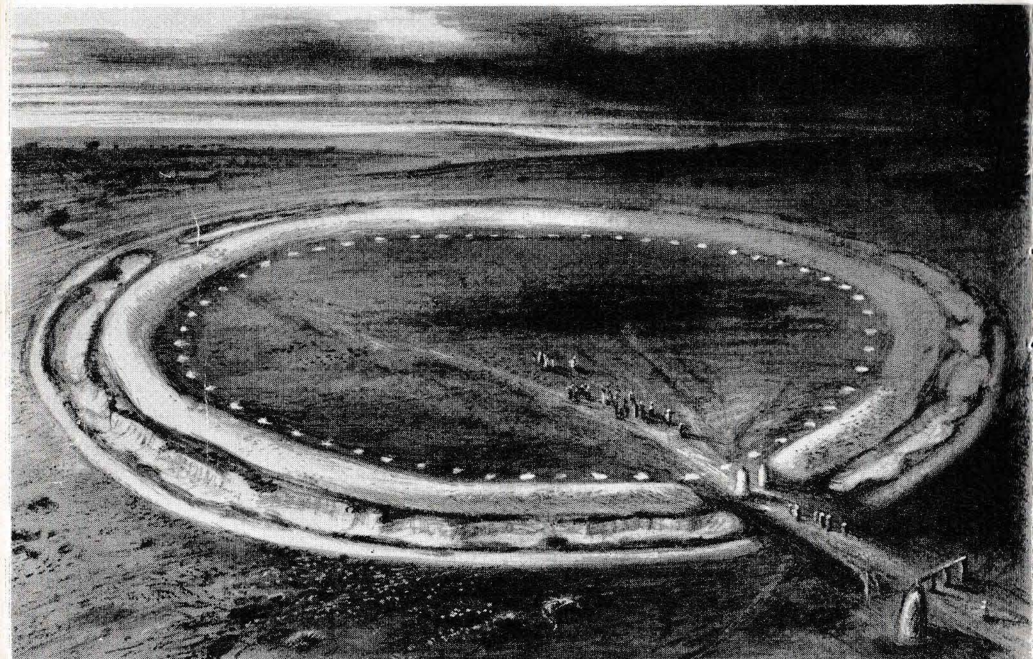
When was Stonehenge built?

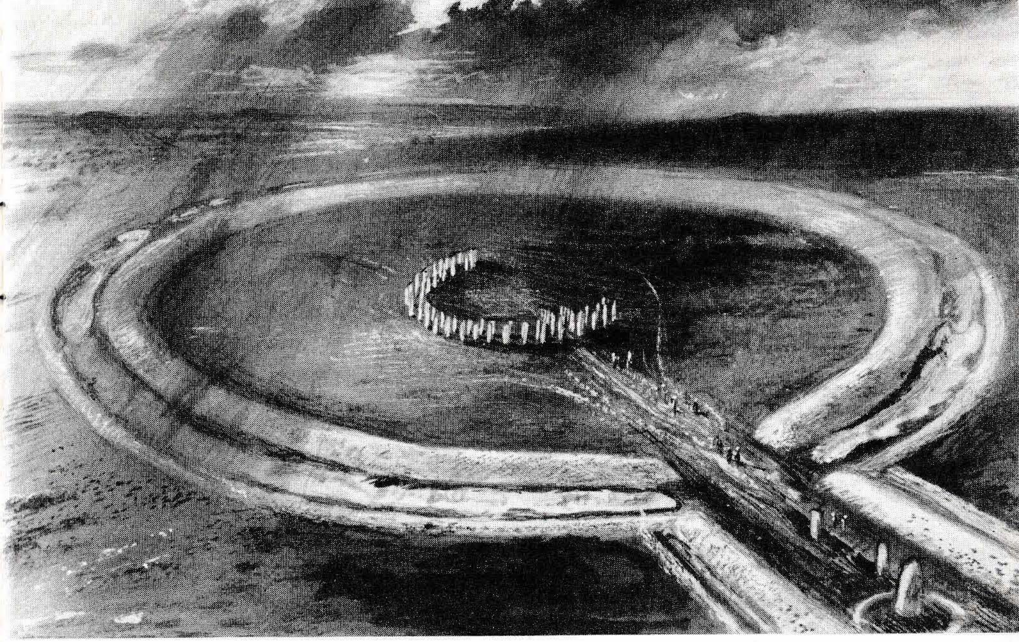
Excavations have shown recently that there was not just one Stonehenge, but three, built one after another in the same place; and the last of these was itself constructed in three stages. The easiest way to distinguish these is to call them Stonehenge I, Stonehenge II and Stonehenge IIIa, IIIb and IIIc.

Stonehenge I was built at the end of the Neolithic period, or New Stone Age, about 1800 B.C. The drawing below shows what this open-air temple may have looked like. A large circular space about 100 yards across was enclosed by the bank and ditch, with an entrance on the north-east side. In this entrance there were probably two stones side by side; and outside it there was a triple archway of timber, with the Heel Stone standing not far away. This is the only stone left from period I. The others were removed in period II.

The ditch was about 20 feet wide and up to 6 feet deep, with very steep sides and a flat bottom. The bank was inside it, and on its inner edge were the Aubrey Holes, a ring of 56 pits about 4 feet wide and 3 feet deep. What they were for is not known, though it is clear that they were just holes, and never had stones or wooden posts standing in them. They must have been sacred places, as many of them were used later for the burial of human bones which had been burned on a funeral pyre. There are similar burials in the bank and ditch filling.

STONEHENGE I





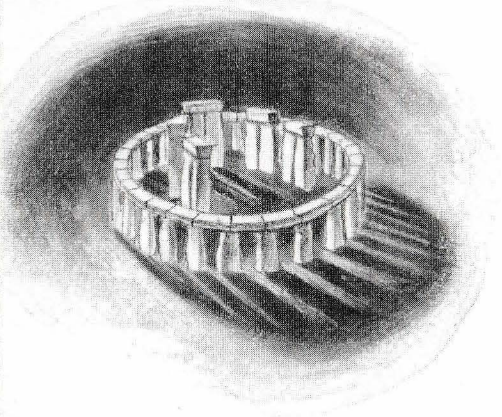
STONEHENGE II

Stonehenge II was probably built around 1600 B.C. by the Beaker people, who had started to settle in eastern and southern Britain from across the North Sea a century or two earlier.

They dismantled the two stones in the entrance of the earthwork, and pulled down the archway of timber. Then they widened the entrance by throwing some of the bank back into the ditch, and built the Avenue to link Stonehenge with the River Avon. The Heel Stone was surrounded by a narrow ditch, soon afterwards filled up, perhaps as a kind of magical protection. Two stones (seen in the drawing above) were set up on the mid-line of the Avenue.

Meanwhile a number of bluestones, in the shape of rough slabs and pillars, had been fetched from Pembrokeshire in south-west Wales. These were set up in the centre of the earlier temple, arranged in two circles about 6 feet apart. The entrance of this double circle was marked by extra stones on the inside, and pointed down the middle of the Avenue towards the sunrise on the longest day of the year.

For some reason which we do not know this arrangement of bluestones was never completed. Rather more than half of the stones were certainly put up. But after that the builders evidently changed their minds and took them down. The holes where they stood have been found, but cannot now be seen on the surface. They lie on either side of the present bluestone circle.



Stonehenge IIIa (above left), was built of sarsen stones, brought from the Marlborough Downs, about 1600 B.C., at the beginning of the Early Bronze Age. By now tools and weapons of bronze, and ornaments of gold, were being made in Ireland and traded across Britain to the Continent. It was probably the profits from this trade which provided the chieftains of Wessex with the power and wealth necessary for building this extraordinary stone temple.

Once the stones had been hauled to the site, the first task was to dress them to shape while they were still lying flat and could be turned over. The sides which were to face inwards were carefully finished; but many of the other surfaces were left in a rougher state with the marks of the tooling still showing (above right). When the dressing of the surfaces had been finished, the positions for the stones were marked out on the ground, and holes were dug for each stone to stand in.

The first stones to be raised must have been the uprights of the horseshoe of trilithons, which are the heaviest and longest. Excavations show that some of these were pulled up from the outer side, and this can have been done only if there was a clear space to work in where the outer circle of sarsen stones now stands. This circle, therefore, must have been put up later than the stones in the centre.

Once in position the uprights had to be left to settle under their own weight in the soft chalk rock. Only then could their tops be dressed level and the tenons formed, so that the lintels could be lifted into place.

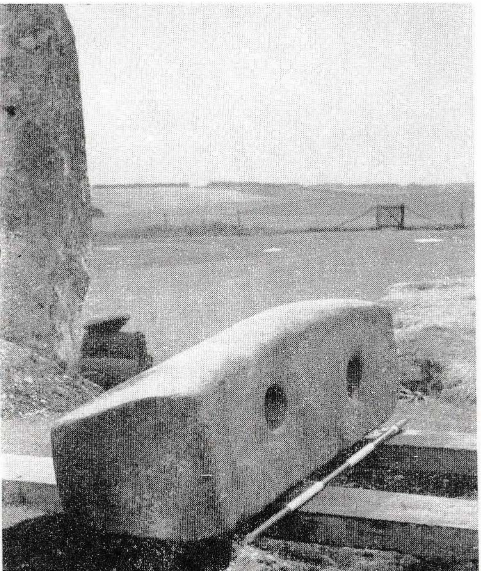
The drawing (above left) shows the plan of the stones at this stage, when the building of sarsens was complete.

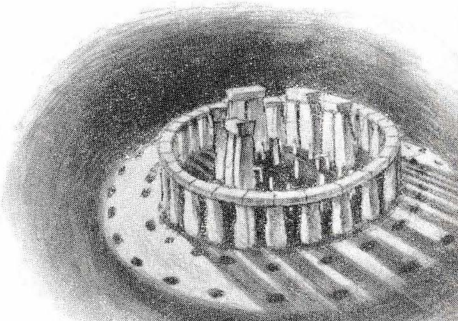
The next stage, Stonehenge IIIb (below right), was probably started as soon as these sarsen stones were in position: indeed, these two stages of building can be regarded as parts of a single plan or design.

About twenty of the larger bluestones were chosen from those which had already been used for Stonehenge II, and these were carefully shaped with stone hammers. They were then set up to form an oval arrangement inside the sarsen horseshoe. This must have included at least two small trilithons, which were copies of the great trilithons of sarsen, because the lintels for two of them were later re-used as pillars in the bluestone circle. One of these lintels is shown, below left, after it had been lifted out of the ground in 1954 so that it could be measured and photographed. It was afterwards put back where it had fallen, so that the mortise holes cannot now be seen. The other lintel is still visible in the bluestone circle, lying fallen with the mortises showing.

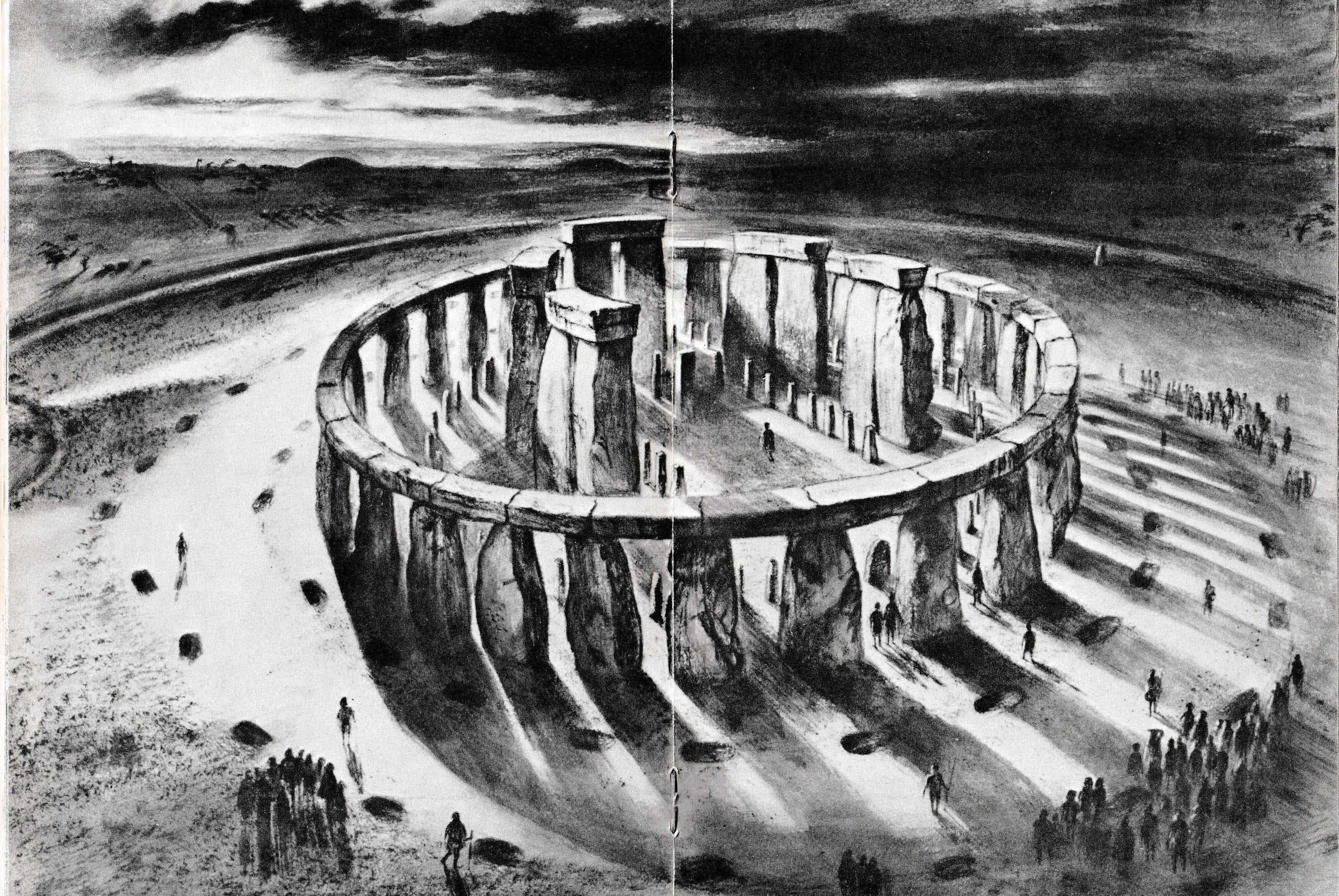
The builders evidently intended next to set up the rest of the bluestones in two rings outside the sarsen circle. They got as far as digging the holes for them (the Y and Z Holes); but just as they were about to dig the last holes something happened to make them change their minds, though we do not know what it was. Instead, when the work had reached the stage shown below, they pulled down the dressed bluestones in the centre, and re-arranged all the bluestones in the circle and horseshoe whose remains we can see today. The Y and Z Holes were left open, and only gradually filled up in the course of time.

The drawing on the next two pages gives an idea of what Stonehenge looked like after this final rebuilding, about 1400 B.C. (Stonehenge IIIc).

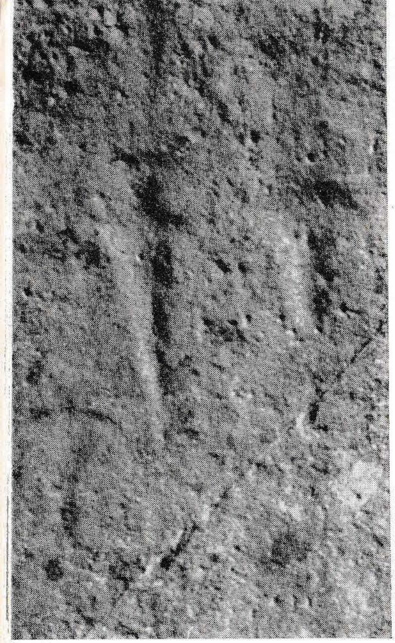


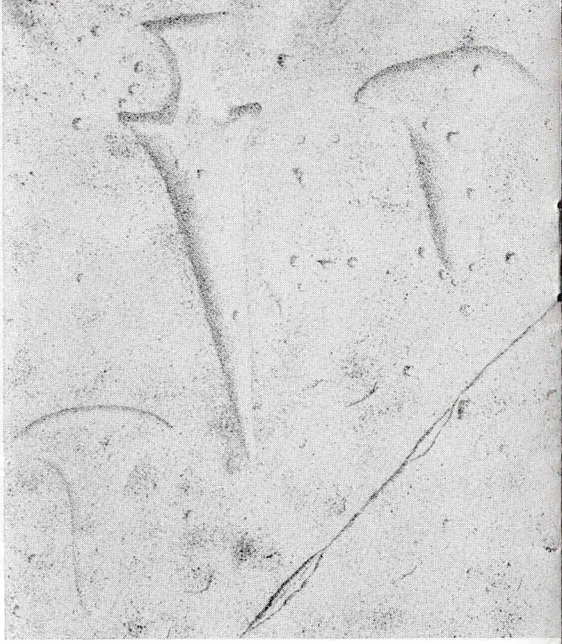


STONEHENGE IIIB



STONEHENGE AFTER ITS FINAL REBUILDING, ABOUT 1400 B.C. (Stage IIIc)





In 1953 several carved symbols were found on some of the sarsen stones. Most of these are full-size carvings of bronze axe-heads, of the kind which were made in Britain as tools and weapons at the beginning of the Early Bronze Age, about 1600 B.C. But the group shown above includes a carving of a dagger, which looks like the daggers used in Greece at the same period. It is on the inside face of the third upright of the sarsen horseshoe, counting clockwise from the open end, about four feet above the ground.

In many of the burials of the Bronze Age in round barrows close to Stonehenge (see back cover), excavators have found beads and other ornaments made in the Mediterranean lands, and perhaps traded to Britain in return for gold and other precious materials. It is surprising to think of trade being carried on over such long distances in prehistoric times, but there is no doubt that it happened, and that other things were reaching Britain from places like Germany and Czechoslovakia at the same period.

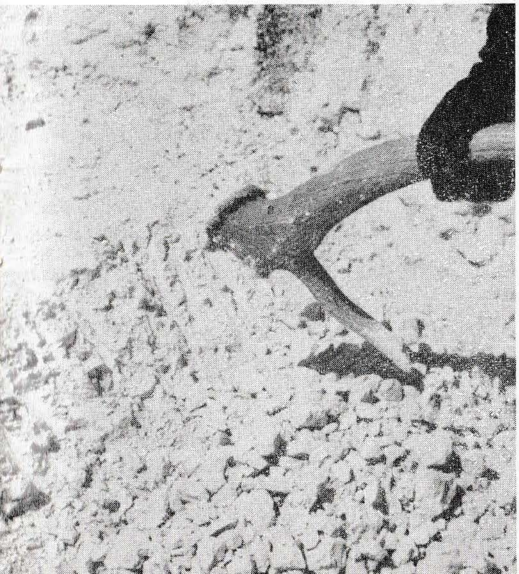
The peculiar details of the sarsen building at Stonehenge are so unusual that it is difficult to see how they could have been invented in Britain. If the dagger carved on this stone is really a Greek one, it suggests that the man who designed Stonehenge III was familiar with prehistoric Greek buildings, and may have been a trader, or even a kind of ambassador, sent to Britain from Greece itself.

How was Stonehenge built?

One of the most remarkable things about Stonehenge is the way in which its builders were able to carry out considerable feats of transport and engineering, using only the simplest tools and equipment and relying on human muscles as the only source of power. It shows us that even at this early date our prehistoric ancestors were very far from being savages. Some of the methods they used have been discovered in the course of excavations. But for others, and particularly for the way the stones were transported over long distances, we have to fall back on guess-work and common sense, simply because work of this sort leaves no traces afterwards for archaeologists to interpret.

The ditches and pits, and the holes for the stones, were all dug with pick-axes made from the antlers of deer. The broken-up chalk was scraped together and shovelled into baskets with the shoulder-blades of cattle, and the baskets were then carried off and dumped where required.

The photographs below show these methods being used in a recent experiment by archaeologists. Although they are very simple, these tools turned out to be surprisingly efficient. A large bank was built out of chalk excavated from a ditch, and the experimenters found that when they used modern picks and shovels, and buckets instead of baskets, the same amount of work was done only twice as fast as with the prehistoric tools.

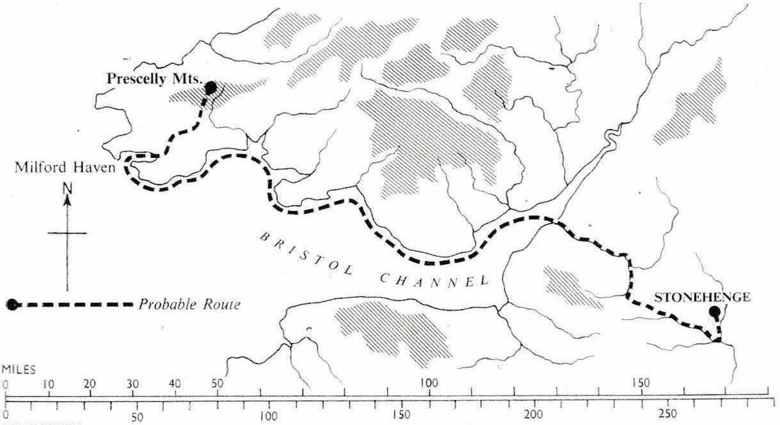


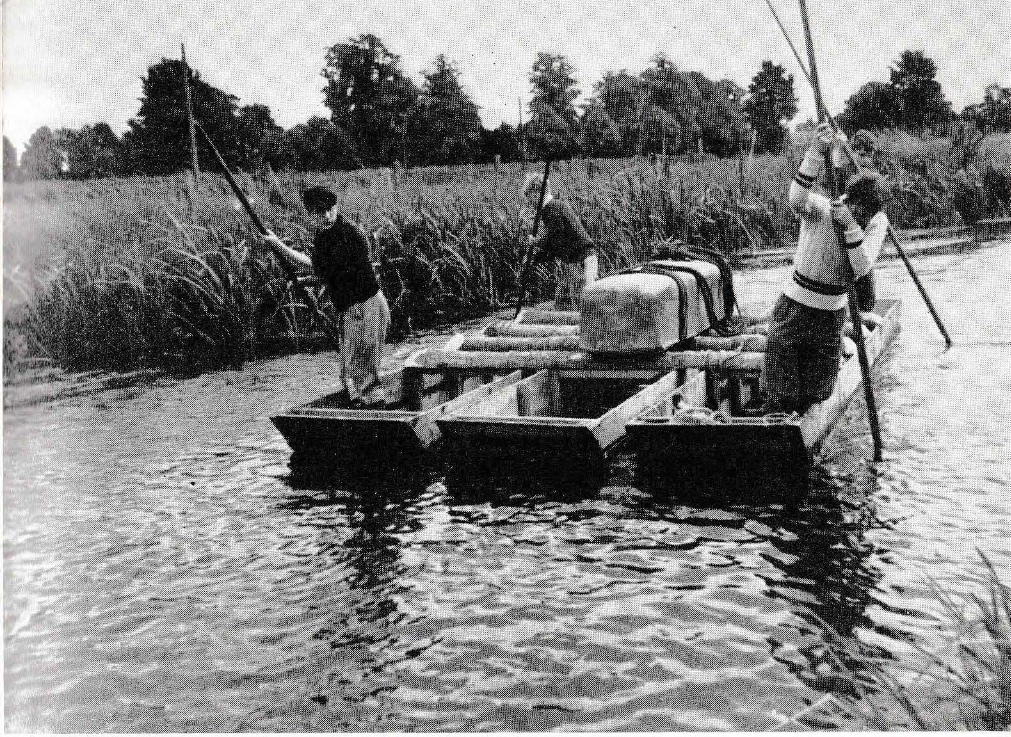
The transport of the bluestones from Pembrokeshire to Stonehenge is one of the most remarkable feats of engineering carried out by prehistoric man in Europe. About eighty stones were moved, and their total weight is certainly more than 100 tons. By looking at thin slices of the bluestones at Stonehenge under the microscope, geologists have been able to show that they must have come, except for two or three, from the Prescelly Mountains in north Pembrokeshire, because it is only there that the same kinds of rock can be found. Even as the crow flies, this is 140 miles from Stonehenge.

We do not know exactly how the stones were moved; but it is a safe guess that boats and rafts were used as far as possible, because this is much easier, and needs fewer men, than hauling them overland.

The dotted line on the map below shows the most probable course for the journey. The stones would be pulled on sledges from the mountain, where the builders could choose them from among thousands of boulders, of all shapes and sizes, lying on the surface. It would not be necessary to quarry them.

When they reached Milford Haven, a huge natural harbour formed by an inlet of the sea, the stones would be loaded on to rafts. The rafts, each with a crew using paddles, and taking advantage of the wind and the tides whenever possible, would follow the south coast of Wales as far as the mouth of the River Avon below Bristol, near the modern town of Avonmouth. Here the stones would be transferred to boats, made of several canoes hollowed out from tree-trunks and lashed side-by-side with a platform or deck on top, to carry the stone. Boats of this sort could float, even when loaded, in the shallower rivers, where rafts would run aground. At sea, however, rafts would be safer because they cannot sink.





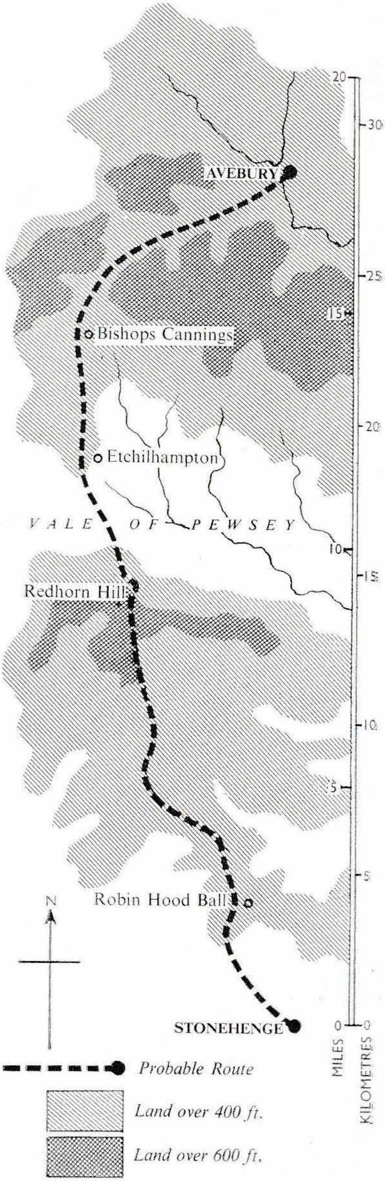
From the mouth of the Bristol Avon the boats would be hauled or poled up the river nearly as far as the modern town of Bradford-on-Avon, and then up the River Frome to a point near where the modern town of Frome now stands. Here the stones would have to be landed, and hauled once more on sledges for about six miles to the east, to the neighbourhood of Warminster. At this point they could again be loaded on to boats, and floated down the River Wylye to Wilton, where it joins the Nadder, and from there a few miles on to Salisbury. Here the route would turn northwards, up the Salisbury Avon, to the end of the Stonehenge Avenue near Amesbury; and at this point the stones would be unloaded, and pulled again on sledges for the last two miles of their long journey. The total distance, following this route, is about 240 miles and nine-tenths of the journey would be by water.

The photograph above shows an experiment made in 1954 to try out these methods. A copy of a bluestone was easily poled up the Avon near Stonehenge by four boys, on a boat made of three canoes fixed together. It was found at the same time that fourteen boys could pull the stone over the ground, loaded on a sledge running on wooden rollers.

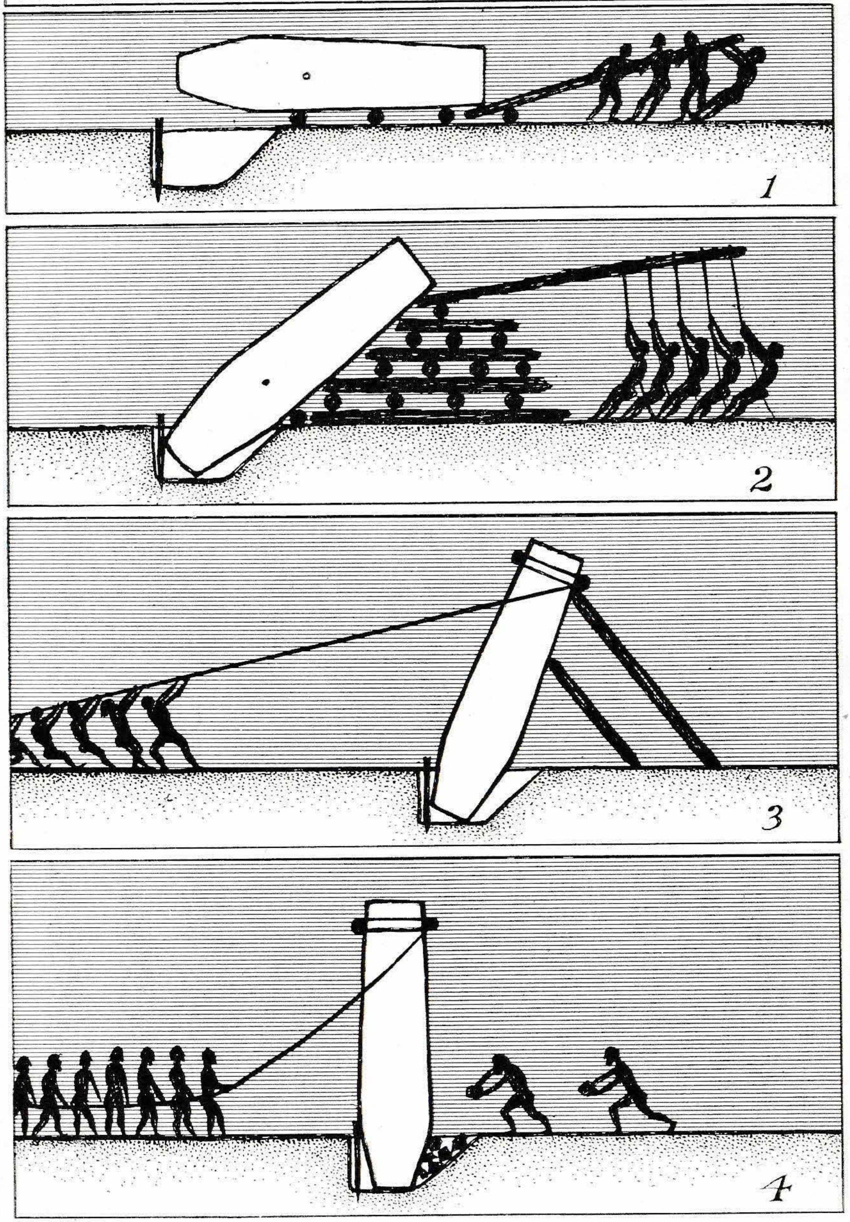
The sarsen stones come from north Wiltshire, about 20 miles away. Here too the stones were not quarried because there are thousands of them lying on the surface. These stones must have been hauled overland all the way, for there are no rivers large enough to carry them. The heaviest sarsens weigh about 50 tons.

We cannot be sure what route the builders chose, but the dotted line on the map on the right marks the easiest journey. At first the ground is flat or runs downhill. But in the Vale of Pewsey there may have been thick forest, through which a track had to be cut; and at Redhorn Hill there is a steep slope leading up on to Salisbury Plain. To pull the heaviest stone up this hill would need at least a thousand men.

The drawing (left) gives an idea of how the sarsens may have been moved. The stone, lashed to a huge sledge, runs on a track of rollers laid in front of it. Six men would be needed to carry each roller, while others used wooden bars to keep the rollers in the right position. To haul the stone shown here, weighing about 25 tons, at least 50 men would be required on level ground, and not less than 250 men when pulling up the steepest slope. The ropes were probably made of cow-hair, or of strips of leather plaited together.

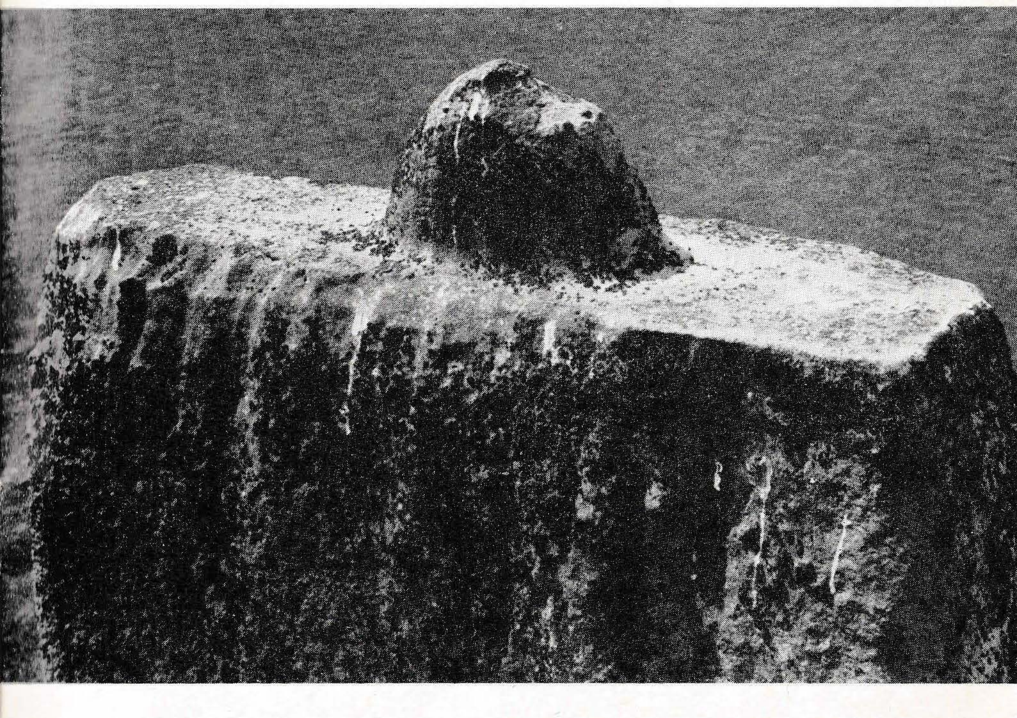


RAISING THE SARSENS

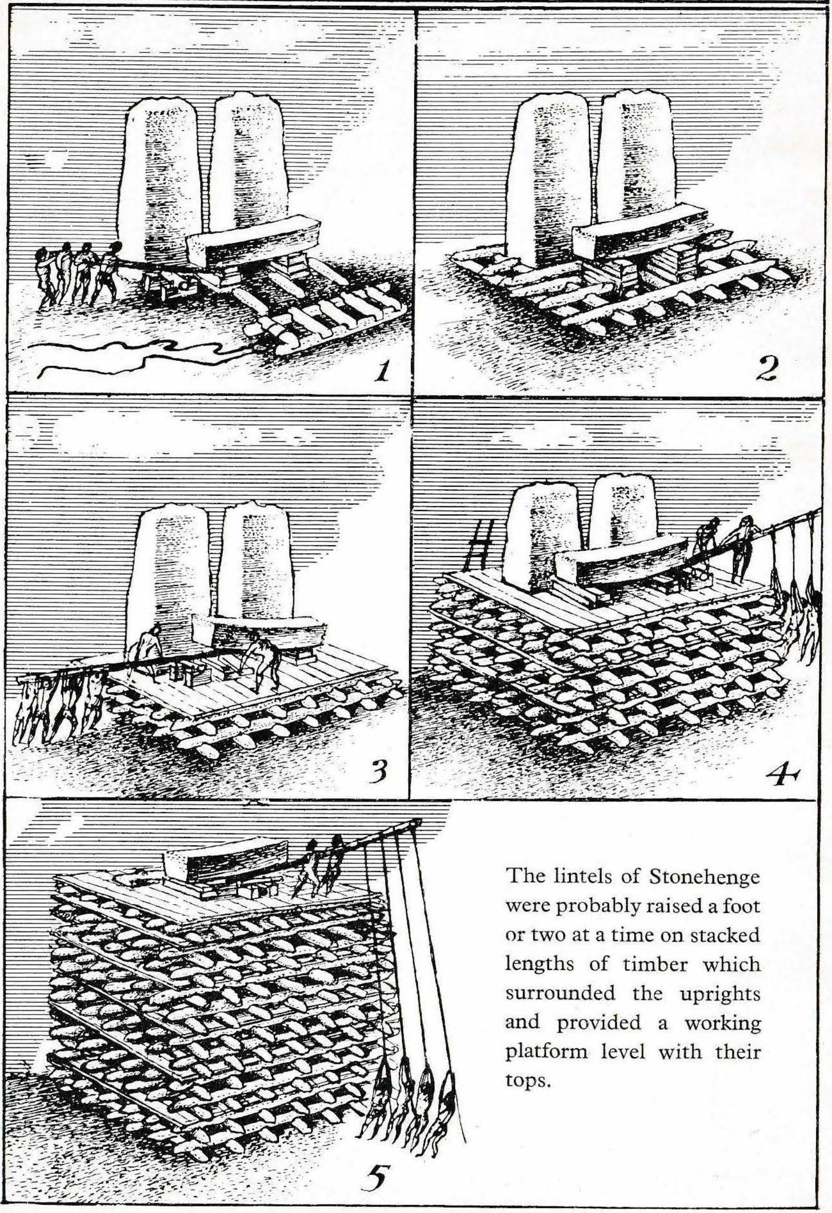


The drawing opposite shows how the stones were probably raised. A hole was dug with one side sloping and the opposite side protected with stakes. The stone was hauled up to the hole on rollers, so that it was nearly balanced like a see-saw on the front roller (1). The top end could then easily be lifted with levers, and the whole stone tipped gradually into the hole, to rest against the sloping side. Then the top was raised a few inches at a time, with levers resting on piled logs (2), and held in place by struts when the logs had to be re-arranged. Finally a gang of men would pull the stone upright with ropes (3), and the hole would be packed with boulders to hold it in place (4).

When the stone had settled in the ground, the top was dressed level by pounding the rock away, leaving a tenon standing up to hold the lintel. The largest of these tenons, shown below, is nine inches high. The drawing on the next page shows how the lintels may have been raised a foot or two at a time, on criss-crossed lengths of piled logs.



RAISING THE LINTELS



The lintels of Stonehenge were probably raised a foot or two at a time on stacked lengths of timber which surrounded the uprights and provided a working platform level with their tops.

What was Stonehenge for?

Archaeologists have been able to find out quite a lot about when the various parts of Stonehenge were built, and how it was probably done. But they can say very little about what it was for, because there are no written records from which we can learn about the ideas and beliefs of the men who built it. Writing was not used in Britain until the country was conquered by the Romans, more than 1,500 years later.

Almost everyone agrees that Stonehenge was a temple; but we shall probably never know what kind of gods were worshipped by its builders, or what kind of ceremonies took place inside it. Some people have suggested that it was a temple for sun-worship, because the entrance points down the middle of the Avenue towards the sunrise on Midsummer Day, the longest day of the year. This may be true, but it cannot be proved for certain.

Another very popular idea is that Stonehenge was built by the Druids; but this is certainly incorrect. We know from writers like Julius Caesar that the Druids were priests in Britain and France during the last two or three centuries before the birth of Christ. But by that time Stonehenge had been standing for more than a thousand years, and was probably already a ruin. There is no reason to suppose that the Druids had anything to do with Stonehenge at all. The idea that it was their temple was invented only 300 years ago by the antiquary John Aubrey, who discovered the Aubrey Holes and wrote the first proper account of Stonehenge.

All that we can really say about the purpose of Stonehenge is that it was a prehistoric temple; and that because it has so many unusual features it was probably a religious centre of very special importance—the Westminster Abbey or the St. Paul's Cathedral of its day.

This Guide has been written by Professor R. J. C. Atkinson, of University College, Cardiff, who has helped to direct the recent excavations at Stonehenge. The reconstructions on pages 6-11, 16, 18, 20 *were drawn by Alan Sorrell, and the drawing on page* 12 *by Professor Stuart Piggott. The maps and plans are by Rietz. The photograph on page* 1 *is by Aerofilms Ltd.; on page* 3 (*bottom*) *by Gateway Film Productions Ltd.; and those on page* 13 *by the British Association Committee on Archaeological Field Experiments. The photographs on pages* 3 (*top*), 4, *and* 5 *are from 'Stonehenge' by R. J. C. Atkinson (Hamish Hamilton,* 1956*; Penguin Books,* 1960) *by permission of the publishers.*

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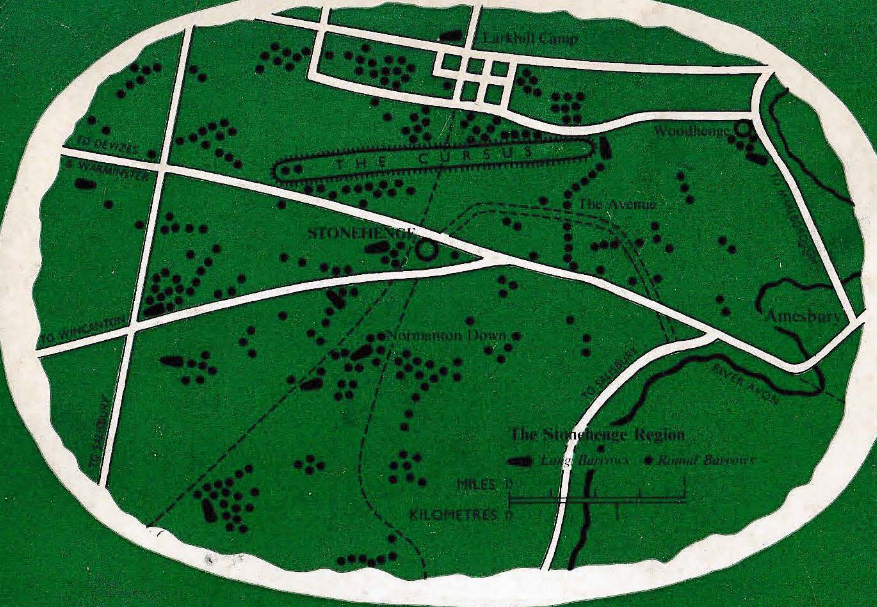

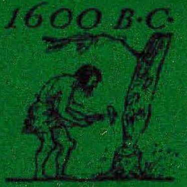

Stonehenge was reshaped a number of times between 1800 B.C. and 1400 B.C. Stonehenge I dates from the New Stone Age or Neolithic Period; Stonehenge II was made by the Beaker people about 1600 B.C.; Stonehenge III was rebuilt in three stages (between about 1600 B.C. and 1400 B.C.) during the Early Bronze Age, when the last major rebuilding took place.

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